United States Department of the Interior
U.S. GEOLOGICAL SURVEY
National Water Quality Laboratory
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# NATIONAL WATER QUALITY LABORATORY TECHNICAL MEMORANDUM 2020.01

31 August 2020

**Subject:** Requirements for the Proper Shipping of Samples to the National Water Quality Laboratory

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## PURPOSE

This memorandum addresses issues related to the shipment and submittal of samples to the NWQL and also provides instructions for completing Analytical Services Request (ASR) forms. This memorandum supersedes NWQL Technical Memorandum 2002.04 and should now be used as the official reference for instructions pertaining to sample shipment and submittal.

A strong partnership between field operations and the NWQL is essential to ensure sample viability, personnel safety, quality, efficiency and final delivery of an optimum product.

*NOTE #1: For purposes of this Technical Memorandum, bottles, solid solvent cartridges, vials, and other types of sample vessels that are used to collect water, sediment, or tissue samples collectively will be referred to as "sample containers."*

## BACKGROUND

More than 30,000 samples consisting of over 150,000 sample containers are sent to the NWQL each year for analysis. Proper packing of samples is needed to ensure that they arrive intact and viable for analysis and to protect the safety and health of laboratory personnel. The NWQL has requirements that district personnel are to follow when submitting samples to the laboratory. This NWQL Technical Memorandum is intended to answer questions and eliminate problems associated with sample shipment and submittal.

## I. PREPARING ANALYTICAL SERVICES REQUEST (ASRs) FORMS FOR SHIPMENT

The most recent version of the ASR (November 2018) is mandatory for all samples shipped to the NWQL. ASRs produced by the PCFF (Personal Computer Field Form) software also are acceptable if they meet the standard format. ASR forms are available on the NWQL Intranet Homepage at http://wwwnwql.cr.usgs.gov/Services.shtml

A surcharge will be added to the cost of the sample when nonstandard ASRs are used.

*NOTE #2: ASRs must be typed or filled out using a pen with permanent, waterproof ink. Felt-tip pens ARE NOT to be used.*

1. Mandatory Information Section

   The following information is required on ASRs to complete the sample login process:

   - USGS station ID (Enter downstream order number, 15-digit latitude, longitude and sequence number or unique sample identifier)
   - phone number
   - e-mail contact
   - user code (Note: user codes revised 1 October 2001)
   - project account number (Note: cost center codes revised 1 October 2002)
   - begin date
   - begin time

   The e-mail contact and phone number are essential information in the event of problems or questions.

2. Site/Sample/Special Project Information Section

   Use the "Comments to NWQL" field of the ASR to communicate the following information:

   a. Contaminated or potentially hazardous (see Rapi-Note 20-21)
   b. Sample volume filtered
   c. Temporary site ID
   d. Lab Prepay
   e. Alternate point of contact and phone number
   f. Dilution may be required

   It is critical that district personnel identify all highly contaminated or potentially hazardous samples so proper precautions are taken. Prior contact with the NWQL for these special cases is required to protect personnel and avoid cross-contamination problems. You are also encouraged to include as much information as possible about the sample and the sample containers. If you are aware, from historical data, that a sample

will require a dilution, please include a comment providing this information.
*Note #3: Items marked with asterisk (*) on the ASR are required for the National Water Information System (NWIS) data storage.*

Analytical Work Requests: Schedules and Laboratory Codes Section

Schedules and lab codes must be listed on the ASR. Also indicate whether the lab code is to be added or deleted. The schedules and lab codes must be current and valid, and verified from the NWQL catalog. The NWQL's catalog is accessible in the new LIMS v11 application (***See example at end of document***). If you do not have access to LIMS v11, please contact LabHelp@usgs.gov for setup and instructions. **Do not** request analytical work by writing analytical request information on the sample containers.

Sample medium code and sample type are required for login of samples at NWQL. If district personnel are logging samples into NWIS, then the only NWIS sample-level code required on the ASR is the medium code. NWIS sample-level codes need to be entered on the ASR only if district personnel are not logging the sample into NWIS; and the QWENTER program is being used to enter the analytical data. If sample-level codes are entered on the ASR and they do not match the codes entered when the sample is logged into NWIS, the sample data will be rejected and placed in the Rejected.Results file.

3. Shipping Information Section

Complete the information about the number and type of sample containers sent. Complete information on sample designations, containers, and preservatives are available in the NWQL catalog. The NWQL's catalog is accessible in the new LIMS v11 application (***See example at end of document***). If you do not have access to LIMS v11, please contact Labhelp@usgs.gov for setup and instructions.

The "NWQL Login Comments" field is reserved for internal NWQL use. The "Collected by" and "Phone No." fields are to be filled in by the customer.

*NOTE #4: Sample containers and ASR information must match and be complete in each shipping container.*

4. Field Values Section

Include pH and specific conductance values for all inorganic samples.

If a specific conductance value is not available from the field or NWQL determination, then samples requiring a specific conductance value for determining dilutions may be diluted unnecessarily, depending on the analysis. This dilution step will raise reporting levels proportional to the applied dilution for affected tests.

## II. SHIPPING CONTAINERS

1. Unchilled samples may be shipped in standard containers and disposable cardboard boxes.
2. Ship chilled sample containers in coolers packed with sufficient ice to maintain temperature at or below 4 degrees C. Securely tape the outside of the shipping container to prevent leaking and to maintain sample integrity. If the cooler has a spigot, seal it with silicone or epoxy to prevent leakage. Damaged coolers will be discarded following district notification. In the interest of safety, do not ship coolers weighing more than 75 pounds.

   NOTE #5: Coolers should be inspected with regard to their condition. Coolers with missing handles, loose fitting lids, cracks, etc., are not to be used.

3. Permanently mark the inside lid of the cooler with return address and telephone number.
4. If FedEx shipping tags are attached to the handles of coolers, ensure the shipping address is also on the cooler in case the handle is broken and becomes separated.

## III. PACKAGING OF SAMPLES

1. Line all shipping containers with two (one bag inside of the other) heavyweight plastic bags. Place sample containers and ice (if required) inside the bag. Seal each bag with a knot or by folding over the top of the bag and securing it with filament tape or twist ties. Fasten the caps on the lids of sample containers securely. Do not use tape or Para film on sample containers.
2. If multiple sample sets are shipped in a single shipping container, label each set of samples and the ASR(s) with a letter or number to assist the NWQL in grouping the samples. Another approach is to place all sample containers from a sample set in a sealable plastic bag or mesh bag. This greatly enhances the segregation of sample sets and improves the efficiency of sample receipt operations. Sealable plastic bags should be folded over and taped.
3. Mark each sample-container sent to the NWQL with a permanent, waterproof marking pen or with a waterproof preprinted label securely attached to the sample container. If preprinted labels are used, take precautions to ensure that the label and the information on it remain intact and legible throughout the shipping process. Avery Weatherproof Laser Address Labels (5510) work well.
4. All sample container labels must contain the following information:
   USGS station ID. (The station ID reflected in the ASR is preferred, however, the station name or field ID may be used as long as it is unique for the sample(s) in that shipment.)
   date of collection time of collection bottle type
   field ID (if applicable) Assigned by the district
   This information is critical because it serves as a link between the sample container and the ASR. Always include the schedule number and lab code adds and deletes on the ASR.
5. Each shipping container should contain at least one ASR and all sample containers associated with that ASR. Do not send samples in a shipping container without an ASR. Likewise, ASRs must not be sent without sample containers. If a sample set has sample containers that can be shipped separately (for example, chilled and unchilled), then each shipping container must have an ASR listing only the applicable schedules or lab codes.

6. Place ASRs in sealed, watertight bags. When shipping samples in coolers, the ASR packet should be taped to the inside lid of the cooler, along with the **return address label** with street address and account number.
7. All sample containers for a particular lab schedule MUST be sent together. If a schedule contains chilled and unchilled sample containers, send all the samples with the chilled sample containers. District personnel may "delete" the schedules or lab codes for sample containers not included in the shipment. These sample containers may be sent separately with ASRs that request only the applicable schedules or lab codes.
8. Ship all glass sample containers in foam sleeves, bubble packs, or in a foam box designed for shipping. If glass sample containers are sent in a carton, arrange the sample containers so that they do not touch each other (use cardboard inserts or foam sleeves). Do not rely on ice to provide cushioning between glass sample containers.
9. Send samples for volatile analysis, bottle type GCV (40-milliliter glass septum vial, amber) in bubble packs, sealable bags, or in foam sleeves. Do not use tape on caps.
10. Do not use "blue-ice" or other types of commercially available refreezeable ices because samples might become contaminated or not maintain an adequate temperature.
11. Do not chill sample containers with dry ice or with other substances that have a freezing point below 0 degrees C. Specific samples, such as chlorophyll and tissue samples, do require the use of dry ice to keep the contents of the shipping container frozen; therefore, these samples must be placed in a separate shipping container. Do not tie plastic bag liners or tape shipping container when dry ice is used because of overpressure from carbon dioxide. Dry ice is considered a "dangerous good" for air transport. When shipping dry ice, follow guidelines provided by the shipping service being used. Contact the shipper's customer service group for specific instructions. Additional paperwork may be required,
12. Do not mix packing materials, such as Styrofoam peanuts, with ice.
13. Do not pack sample containers in vermiculite.
14. Polyethylene bottles should be used for radiochemical or stable isotope samples whenever possible.
15. Do not ship radon samples in coolers.
16. Use sufficient amount of ice to keep samples well chilled during transit. The volume of ice should be equal to or greater than the volume occupied by the samples. Use twice the volume of ice during warm months.

## IV. SHIPPING SAMPLES TO THE NWQL

None of the package-carrier services will deliver leaking coolers or boxes. To ensure that samples are not discarded or set aside by the carrier, take special precautions to make certain that the coolers or boxes are not leaking, and, in the case of coolers, that they can remain leak-proof even after the ice has begun to melt.

Send chilled and time-dependent samples to the NWQL by the most expedient means possible. The temperature of the cooler will be measured during sample login and documented in the Laboratory Information Management System (LIMS). In general, ship all time-dependent samples by a reliable express delivery service, such as Federal Express, Priority Overnight. Ship radon samples priority overnight using the "Fed Ex Pak" or medium box, which are available from Federal Express free of charge. Never ship radon samples to arrive at the NWQL on a

Saturday. Samples shipped on Friday via Federal Express will be picked up Saturday by the NWQL during busy sampling season. If unsure, contact NWQL Lab Login before shipping sample. However, the samples are not logged in for analysis until Monday.

Please indicate "Priority Overnight and Saturday Delivery" on the Federal Express air bill. The NWQL is closed on all Federal holidays; therefore, extremely time-dependent samples should not be shipped in conjunction with a holiday. Use the following address when shipping samples to the NWQL:

National Water Quality Laboratory
Building 95, Ent E-3
Denver Federal Center
Denver, CO 80225-0046

Unchilled samples that are not time dependent may be sent the most economical way. The U.S. Postal Service (USPS) first-class mail, United Parcel Service (UPS), and Federal Express Ground offer 3- to 5-day delivery of samples using ground transportation

Chain-of-custody samples should be shipped according to the procedures outlined in NWQL Home page, Quick Links, Shipping Information.

Requests for custom analyses must be made in advance by contacting lablogin@usgs.gov. Because the custom lab codes are project-specific, they are not listed in the NWQL catalog.

By following the suggestions set forth in this memorandum, district personnel will greatly reduce the possibility for error or delay in the analysis of their samples. Additional questions about sample shipment and submittal may be directed to the Login supervisor, Mark Cree mecree@usgs.gov, (303) 236-3181.

This guidance is consistent with WMA Technical Note 72, which can be found here.

To send and receive inquiries regarding sample submittal, receipt, and login, email lablogin@usgs.gov.

//signed//

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**Supersedes:** NWQL Technical Memorandum 2002.04

**Key Words:** shipping, packaging, samples, sample containers

**Distribution:** by Rapi-Note announcement posted to http://wwwnwql.cr.usgs.gov/USGS (the

NWQL USGS-visible intranet; internal USGS access only)

**Definitions:** Rejected.Results – File output from the National Water Information System (NWIS) that is produced when a coding error occurs or mandatory information is missing resulting in data being rejected for storage in NWIS.

Sample – Any medium that will be analyzed by the NWQL. Includes water, sediment, tissue, and filters.

Sample container – Any sample vessel used to collect water, sediment or tissue samples. Includes bottles, cartridges, and vials.

Shipping container – Any container used to ship samples to the NWQL for analysis. Includes cardboard boxes, coolers or ice chests, Federal Express packages or Styrofoam boxes.

## LIMS v11 Catalog Location

Example of LIMS v11 main page after logging in. (Your "Main Page" may differ)

- Left side, click Sample Planning and Mana … down arrows
- Select Catalog